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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/789,118	02/27/2004	Teng-Wang Huang	10808/125	7607
48581	7590	08/04/2005	EXAMINER	
BRINKS HOFER GILSON & LIONE			NGUYEN, HA T	
INFINEON				
PO BOX 10395			ART UNIT	PAPER NUMBER
CHICAGO, IL 60610			2812	

DATE MAILED: 08/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/789,118

Applicant(s)

HUANG ET AL.

Examiner

Ha T. Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 July 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) 12-14 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Notice to Applicants

1. Applicants' election without traverse of Group I, claims 1-11, in the response filed 07-08-05 is acknowledged. Claims 12-14 are withdrawn from consideration.

Claim Objections

2. Claims 1-11 are objected to because of the following informalities: In claim 1, lines 13, deletion of "of the to" and in claim 4, line 3, deletion of "of" are suggested for correctness. Appropriate correction is required.

Claims 2-11 variously depend from claim 1, they are objected to for the same reason.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(a) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beintner (USPN 6893911) in view of Nagayama (USPN 6057243).

Referring to Figs. 1-8 and related text, [Re claim 1] a method for producing a liner mask on a semiconductor structure comprising: providing an amorphous liner layer 487 on a top side of the semiconductor structure 233 in a deposition process; performing an implantation of extrinsic ions in a subregion of the liner layer for decreasing the etching rate of the subregion in the predetermined etchant and creating a etch selectivity between the subregion complementary subregion and the subregion in the predetermined etchant; and selectively removing the sub - region complementary subregion opposite to the subregion in an etching step in the pre - determined etchant for completing the liner mask (see col. 3, line 57-col. 4, line 29). But it fails to disclose expressly the first temperature of the deposition process; annealing the amorphous liner layer at a second temperature, being higher than the first temperature, for increasing a degree of crystallisation and for generating at least a semi-crystalline liner layer whose etching rate in a predetermined etchant is higher than an etching rate of the amorphous liner layer. However, the missing limitations are well known in the art because Nagayama discloses these features (See col. 5, line 39- col. 6, line 34 and col.. 9, line 16-col. 10, line 5). A person of ordinary skill is motivated to modify Beintner with Nagayama to obtain even better etch selectivity.

[Re claim 4] Beintner also discloses where on the top side of the semiconductor structure underneath the liner layer, a further liner layer 380 is provided, on which the etching step for selectively removing the complementary subregion stops.

[Re claim 6] Nagayama also discloses where the first temperature is between approximately 400C and approximately 600C and the second temperature is between approximately 700C and 1100C (see col. 9, lines 16-37). In the case where the claimed ranges “overlap or lie inside ranges disclosed by the prior art” a prima facie case of obviousness exists. In re Wertheim, 541 F. 2d 257, 191 USPQ 90 (CCPA 1976); In re Woodruff, 919 F. 2d 1575, 16 USPQ 2d 1934 (Fed. Cir. 1990)

[Re claim 8] wherein the liner layer includes silicon and the extrinsic ions include boric ions or boron ions (see col. 9, lines 16-60).

[Re claims 2, 7, and 9] where the semiconductor structure comprises a trench and that the implantation is performed so that the complementary subregion lies in the trench (see Fig. 4, portion between the two projected portions).

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[Re claim 10] Arguments used for the rejection of claim 4 also apply.

[Re claims 3, 5, 6, and 11] Arguments used for the rejection of claim 6 also apply.

Therefore, it would have been obvious to combine Beintner with Nagayama to obtain the invention as specified in claims 1-11.

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ha T. Nguyen whose telephone number is (571) 272-1678. The examiner can normally be reached on Monday-Friday from 8:30AM to 6:00PM, except the first Friday of each bi-week. The telephone number for Wednesday is (703) 560-0528.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael S. Lebentritt, can be reached on (571) 272-1873. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Ha Nguyen
Primary Examiner
08- 2 - 05